**Curriculum Vitae**

Vicki L. Gray, M.P.T., Ph.D.

Research Associate, Department of Physical Therapy and Rehabilitation Science,

University of Maryland School of Medicine

**Date** October 3, 2019

**Contact Information**

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Foreign Languages English

**Education**

1992 B.P.A., Public Administration, University of Windsor, ON

2004 B.H.K., Human Kinetics (Movement Science), University of Windsor, ON

2009 M.P.T., Physical Therapy, Western University, London, ON

2012 Ph.D., Health and Rehabilitation Science (Physical Therapy), Western University ON

**Post-Doctoral Training**

2013-2016 Physical Therapy and Rehabilitation Science, University of Maryland, Baltimore Advisors: Mark Rogers and Sandy McCombe Waller

**Medical Licensures**

Active College of Physical Therapists of British Columbia, Canada

Employment History

**Academic Appointments**

2007-2010 Research Assistant, Physical Therapy, University of Western Ontario

2010-2012 Research Assistant, Physical Therapy, University of British Columbia

 2012 Research Associate, Physical Therapy, University of British Columbia

2016-2018 Research Associate, Department of Physical Therapy and Rehabilitation Science, University of Maryland Baltimore

2018- Assistant Professor, Department of Physical Therapy and Rehabilitation Science, University of Maryland Baltimore

**Other Employment**

1992-2005 Supervisor, KELCOM Telemessaging, Windsor, ON

2012 Physiotherapist, Lions Gate Hospital, North Vancouver, BC

## Professional Society Membership

2009-present General Member, Canadian Physiotherapy Association (Neuroscience Division) 2010-present General Member, Society for Neuroscience 2011-present Registrant, College of Physiotherapists of British Columbia

2013-present General Member, American Heart Association

2014-present General Member, International Society of Posture and Gait Research

**Honors and Awards**

2005-2006 Western Graduate Research Scholarship Physical Therapy $2,215

2006-2007 Western Graduate Research Scholarship Physical Therapy $3,900

2007 Society of Graduate Students: Ontario Student Opportunity Trust Fund $1,000

2007-2008 Graduate Bursary $2,040 2008 Society of Graduate Students: Ontario Student Opportunity Trust Fund $1,000

2009-2012 Western Graduate Research Scholarship Rehabilitation Sciences $57,000

2016 Awardee, Training in Grantsmanship for Rehabilitation Research (TIGRR)

2016 Best poster, Gray VL, Yang, CL, McCombe Waller S, Rogers MW. The influence of sensorimotor deficits on unexpected lateral perturbations after stroke. APTAMD & DCPTA Annual Conference, Baltimore, MD, Poster, November 2016.

2017 Elite Reviewer 2017, *Archives of Physical Medicine and Rehabilitation*

**Administrative Service**

**Institutional Service**

 2005-2006 Student Representative M.Sc. Program Committee, University of Western Ontario

2006-2007 Student Representative M.Sc./Ph.D. Physical Therapy Field Committee, University of Western Ontario

2007-2010 Mentor, Mentorship Program, Health and Rehabilitation Science, University of Western Ontario

2013 Awards reviewer, Graduate Program in Life Sciences (GPILS) Awards

2015 Awards reviewer, Graduate Program in Life Sciences (GPILS) Awards

2016 Search Committee, Part-time (.60 FTE) Faculty Position

2018 Discussion Table Leaders UM SOM OSR Mid-Summer Research Retreat

**National Service**

2013- present Manuscript reviewer, *Disability and Rehabilitation* (2x/yr)

2013- present Manuscript reviewer, *Archives of Physical Medicine and Rehabilitation* (3x/yr)

2013- present Manuscript reviewer, *Neurorehabilitation and Neural Repair* (1x/yr)

2014 Grant Reviewer, NIDILRR, Health and Function

2016 Grant Reviewer,[*Kentucky Science & Engineering Foundation*](http://ksef.kstc.com/)

2016-present Grant Reviewer, NIDILRR, Health and Function

2016- present Manuscript reviewer, *Journal of Applied Physiology* (1x/yr)

2016 Abstract Reviewer, 21st IAGG World Congress of Gerontology and Geriatrics

2017-present Manuscript reviewer, *Journal of Motor Behavior* (2x/yr)

2017-present Manuscript reviewer, *Physiotherapy Theory and Practice* (1x/yr)

2017-present Manuscript reviewer, *Journal of Electromyography & Kinesiology* (1x/yr)

2017-present Manuscript reviewer, *Topics in Stroke* (2x/yr)

2018- Manuscript reviewer, Journal of Gerontology: Medical Sciences (1x/yr)

2018- Manuscript reviewer, Human Factors and Ergonomics in Manufacturing & Service Industries (1x/yr)

**Teaching Service**

University of Western Ontario

2005 Graduate Teaching Assistant, Faculty of Health Science HS203/KIN222 Human Anatomy

 58 undergraduates (2 lab groups) 2 hours/week for 10 weeks

2006Graduate Teaching Assistant, Faculty of Health Science

 HS203 Human Anatomy

 130 undergraduates (4 lab groups) 4 hours/week for 10 weeks

 130 undergraduates 2hr lecture: Central Nervous System

2006 Graduate Teaching Assistant and Lab Coordinator, Faculty of Health Science HS203/KIN222 Human Anatomy

 38 students 1 hour /week for 10 weeks

2007 Graduate Teaching Assistant, Faculty of Health Science

 HS411 Critical Appraisal

 2009 Graduate Teaching Assistant, School of Physical Therapy

 PT9511: Foundations of Physical Therapy Practice

 50 undergraduates 2 hour/8 labs)

University of British Columbia

2010 Clinical Skills Assistant, Department of Physical Therapy

RSPT516 Clinical Decision Making, 80 students (4 contact hours)

2012 Course Manager, Research Methods, Rehabilitation Sciences

 RHSC500: 3 Ph.D. and 7 MSc students (3 hours/week for 9 weeks)

University of Maryland Baltimore

2013 Lab Assistant, geriatrics, balance, cranial nerves

 Department of Physical Therapy and Rehabilitation Science

 BS2: Basic Science: 54 DPT students (6 contact hours)

2014 Seminar Facilitator, research

 Department of Physical Therapy and Rehabilitation Science

 NM2: Neuromuscular: 12 DPT students (6 contact hours)

2014 Seminar Facilitator, research

 Department of Physical Therapy and Rehabilitation Science

 Medial Issues: 13 DPT students (2 contact hours)

2014 Lab Assistant, muscle lab

 Department of Physical Therapy and Rehabilitation Science

 BS2: Basic Science: 54 DPT students (3 contact hours)

2014 Lab Assistant, balance, geriatrics, stroke research

 Department of Physical Therapy and Rehabilitation Science

 NM1: Neuromuscular: 54 DPT students (11 contact hours)

2015 Seminar Facilitator, research

 Department of Physical Therapy and Rehabilitation Science

 NM2: Neuromuscular: 12 DPT students (6 contact hours)

2015 Lab Assistant, muscle lab

 Department of Physical Therapy and Rehabilitation Science

 BS2: Basic Science: 56 DPT students (3 contact hours)

2015 Lab Assistant, balance, geriatrics, stroke research

 Department of Physical Therapy and Rehabilitation Science

 NM1: Neuromuscular: 56 DPT students (11 contact hours)

2015 PBA examiner, balance outcome measures

 Department of Physical Therapy and Rehabilitation Science

 NM1: Neuromuscular: (5 contact hours)

2016 Lab Assistant geriatrics, stroke research

 Department of Physical Therapy and Rehabilitation Science

 NM1: Neuromuscular: 65 DPT students (5 contact hours)

2016 Lab Assistant, muscle lab

 Department of Physical Therapy and Rehabilitation Science

 BS2: Basic Science: 60 DPT students (3 contact hours)

2016 PBA examiner, balance outcome measures

 Department of Physical Therapy and Rehabilitation Science

 NM1: Neuromuscular: (5 contact hours)

2017 Lab Assistant stroke research

 Department of Physical Therapy and Rehabilitation Science

 NM1: Neuromuscular: 65 DPT students (3 contact hours)

2017 Lab Assistant, muscle lab

 Department of Physical Therapy and Rehabilitation Science

 BS2: Basic Science: 65 DPT students (3 contact hours)

2018 Lab Assistant geriatrics, stroke research

 Department of Physical Therapy and Rehabilitation Science

 NM1: Neuromuscular: 65 DPT students (5 contact hours)

2018 Lab Assistant, muscle lab

 Department of Physical Therapy and Rehabilitation Science

 BS2: Basic Science: 65 DPT students (3 contact hours)

2018 Seminar Facilitator, research

 Department of Physical Therapy and Rehabilitation Science

 NM1: Neuromuscular: 12 DPT students (2 contact hours)

2019 Lecturer, Auditory, Oculomotor and Visual System, Vascular and Temperature Physiology

 Department of Physical Therapy and Rehabilitation Science

 BS2: Basic Science: 65 DPT students (5 contact hours)

2019 Seminar Facilitator, research

 Department of Physical Therapy and Rehabilitation Science

 NM1: Neuromuscular: 12 DPT students (6 contact hours)

 Medial Issues: 12 DPT students (3 contact hours)

2019 Lecturer, Auditory, Oculomotor, and Visual System

 Department of Physical Therapy and Rehabilitation Science

 BS2: Basic Science: 65 DPT students (2 contact hours)

2019 Lecturer, Stroke and Brain Tumor

 Department of Physical Therapy and Rehabilitation Science

 NM1: Neuromuscular: 65 DPT students (3 contact hours)

2019 Lecturer, Neuropathology

 Department of Physical Therapy and Rehabilitation Science

 BS2: Basic Science: 65 DPT students (2 contact hours)

2019 Seminar Facilitator, research

 Department of Physical Therapy and Rehabilitation Science

 NM1: Neuromuscular: 12 DPT students (2 contact hours)

Continuing Education Courses

2016 Instructors: Sandy McCombe Waller, Doug Savin, Vicki Gray

 Postural Control and UE Function Post Stroke: Intervention Strategies (0.4 CEU)

2017 Instructor: Vicki Gray

 Stroke Rehabilitation, Elon University, North Carolina (0.6 CEU)

2018 Instructor: Vicki Gray

 Stroke Rehabilitation, University of Maryland Baltimore (0.6 CEU)

**Grant Support**

**Active Grants**

1/1/2018-12/31/2018 NCE (Co-I, 5%, PI: Marchese)

*“Examining a Fast Movement Approach to Pediatric Physical Therapy Intervention in Children and Adolescents that have Completed Medical Treatment for Acute Lymphoblastic Leukemia.”*

APTA, Academia of Pediatric Physical Therapy

Total Direct Costs: $30,000

*Role: Overseeing the pre- and post- clinical outcome measures and laboratory assessment.*

6/1/2017-5/30/2021 (Co-I, 20%, PI: Lal PI)

 *“Asymptomatic Carotid Stenosis: Cognitive Function and Plaque*

*Correlates – 2.”*

VA Merit Award-CSR&D

Total Direct Costs: $700,000

*Role: Balance and mobility assessments tests pre-surgery and post-surgery.*

9/1/2018-8/31/2020 (PI, 10%)

*“Neuromuscular and Biomechanical Control of Lower Limb Loading in Individuals with Chronic Stroke”*

NIA R21

Total Direct Costs: $275,000

*Role: Overseeing the training protocol of the intervention.*

9/1/2018-5/31/2023 (PI, 50%)

*“Hip Muscle Power, Lateral Balance Function, and Falls in Aging”*

NIA R01

Total Direct Costs: 1,700,000

*Role: Project management.*

 **Completed Grants**

2017-2019 (PI, $25,000)

 *“Cognitive-motor training to enhance cognitive and physical function in people with asymptomatic carotid stenosis.”*

University of Maryland Older Americans Independence Center Research Career Development Scholar

Annual Direct Costs: $25,000

Total Direct Costs: $50,000

2015-2016 Gray (PI)

*“Can lateral step training improve initial postural adjustments in stroke. “*

Claude D. Pepper Older Americans Independence Center Research and Development Core Pilot Grant (NIA P30AG028747)

 Total Direct Costs: $30,000

2014-2015 Gray (PI)

 *“Changes in balance and falls from an intervention of voluntary or reactive lateral step training.”*

National Institute of Disability, Independent Living and Rehabilitation Research, Switzer Merit Fellow H133F140027

Total Direct Costs paid directly to PI: $75,000

2014-2016 Gray (PI, 50%)

 *“Comparison of voluntary and reactive stepping in chronic stroke and healthy controls and comparison of changes in stepping strategies after an intervention of stepping.”*

American Heart Association, Mentored Clinical & Population Research Award, 14CRP19880025

Annual Direct Costs: $70,000

Total Direct Costs: $140,000

2014-2016 (declined) American Heart Association, Postdoctoral Fellowship Award

**Publications**

**Peer-reviewed journal articles**

1. Garland SJ, **Gray VL**, Knorr S. Muscle activation patterns and postural control following stroke. *Motor Control.* 2009:13(4): 387-411.
2. **Gray VL**, Ivanova TD, Garland SJ. Fast squatting movements after stroke. *Clinical Neurophysiology.* 2012:123(2): 344-50.
3. **Gray VL**, Rice CL, Garland SJ. Factors that influence muscle weakness following stroke and their clinical implications: A critical review. *Physiotherapy Canada.* 2012:64(4): 415-426.
4. **Gray VL**, Ivanova TD, Garland SJ. Retraining postural responses with exercises emphasizing speed post-stroke. *Physical Therapy*. 2012: 92(7): 924-34.
5. **Gray VL**, Ivanova TD, Garland SJ. Effects of fast functional exercise on muscle activity after stroke*.* *Neurorehabilitation and Neural Repair.* 2012: 26(8): 968-75.
6. **Gray VL,** Ivanova TD, Garland SJ. Reliability of center of pressure measures within and between sessions in individuals post-stroke and healthy controls. *Gait & Posture.* 2014:40(1):198-203.
7. **Gray VL,** Pollock CL, Wakeling JM, Ivanova TD, Garland. Patterns of muscle coordination during stepping responses post-stroke. *Journal of Electromyography and Kinesiology.* 2015: 25(6): 959-965.
8. **Gray VL,** Ivanova TD, Garland SJ. A single session of open kinetic chain movements emphasizing speed improves speed of movement and modifies postural control in stroke. *Physiotherapy Therapy and Practice*. 2016: 32(2):113-123.
9. McCombe Waller S, Yang CL, Magder L, Yungher D, Creath R, **Gray V**, Rogers MW**.** Impaired motor preparation and execution during standing reach in people with chronic stroke**.** Neuroscience Letters.2016:630:38-44.
10. Hsiao, H, **Gray, VL**, Creath R, Binder-MacLeod, SA, Rogers, MW. Control of lateral weight transfer is associated with walking speed in individuals post-stroke. Journal of Biomechanics, 2017:60(72-78)*.*
11. **Gray VL**, Yang, CL, McCombe Waller S, Rogers MW. Lateral perturbation induced stepping: Strategies and predictors in persons post-stroke. Journal of Neurologic Physical Therapy,2017:41(4):222-228.
12. **Gray VL**, Yang, CL, Fujimoto M, McCombe Waller S, Rogers MW. Stepping characteristics during externally induced lateral reactive and voluntary steps in chronic stroke. *Gait & Posture*, 2019:71(198-204).
13. **Gray, VL**, Goldberg AP, Rogers MW, Anthony L, Terrin ML, Guralnik JM, Blackwelder WC, Lam D, Sikdar S, Lal BK. Asymptomatic carotid stenosis is associated with mobility and cognitive dysfunction and heightens falls in older adults. Journal of Vascular Surgery, accepted.

**Book Chapters**

1. Rogers MW, Martinez KM, McCombe Waller S, **Gray VL**. Recovery and Rehabilitation of Standing Balance after stroke. In: Stein J, Harvey R, Macko R, Winstein C, Wittenberg GF, Zorowitz RD, eds. Stroke Recovery and Rehabilitation, 2nd Edition, New York, NY: Demos Medical Publishing, 2014.

**Proffered Communications**

Local

1. **Gray VL**, Ivanova TD, Garland SJ. Open kinetic chain exercises emphasizing speed post-stroke. STEPUP 2012, Physiotherapy Research Forum for Vancouver Coastal Health, Vancouver, BC, Presentation, 2012.
2. **Gray VL**, Pollock C, Wakeling JM, Ivanova TD, Garland SJ. Muscle Coordination patterns during self-induced stepping reactions post-stroke. PTRS Research Day, University of Maryland, Baltimore, MD, Presentation, 2013.
3. **Gray VL.** Does perturbation based training increase paretic limb use? Quarterly Interdisciplinary Research Meeting. University of Maryland Rehabilitation & Orthopaedic Institute, Baltimore, MD, 2016, *Invited.*
4. **Gray VL**, Yang, CL, McCombe Waller S, Rogers MW. The influence of sensorimotor deficits on unexpected lateral perturbations after stroke. APTAMD & DCPTA Annual Conference, Baltimore, MD, Poster, November 2016.
5. **Gray VL**. Can lateral step training improve initial postural adjustments in stroke? UM-OAIC Pepper Center External Advisory Board Meeting, Baltimore, MD, November 2016.
6. **Gray, VL**. Voluntary vs. Induced step training on balance and falls after stroke. Rehabilitation Science Research Seminar, April 2018, *invited.*
7. **Gray VL**. Cerebral vascular effects on balance control. UM-OAIC Pepper Center External Advisory Board Meeting, Baltimore, MD, May 2018, *invited*.

National

1. **Gray VL**, Ivanova T, Garland SJ. Remodeling of muscle activation patterns with exercise following stroke. Canadian Physiotherapy Association, Ottawa, ON, Presentation, 2008.
2. **Gray VL**, Ivanova TD, Garland SJ. Motor strategies in fast squatting movements after stroke. Exercise Neuroscience Meeting, London, ON, Presentation, 2009.
3. **Gray VL**, Ivanova T, Garland SJ. Changes in anticipatory postural adjustments following an exercise protocol in individuals following stroke. Canadian Stroke Congress, Quebec City, QC, Poster, 2010.
4. Garland J, Pollock C, **Gray V**. Training speed of movement post-stroke. Canadian Physiotherapy Association (CPA) Congress, Whistler, BC, Presentation, 2011.
5. **Gray VL**, Ivanova TD, Garland SJ. Changes in muscle activity during fast functional movements after stroke. Exercise Neuroscience Meeting, Waterloo, ON, Presentation, 2011.
6. **Gray VL**, Fujimoto, M, McCombe Waller S, Rogers MW. Stepping strategies for lateral balance recovery during unexpected lateral perturbations and lateral voluntary stepping in persons post-stroke. APTA Combined Sections Meeting, Indianapolis, IN, Presentation, 2015.
7. Inacio M, **Gray V**, Bair W, Yang C, Sanders O, Abarro J, Gaeta A, Prettyman, Creath R, McCombe-Waller S, Rogers MW. Combining high intensity lateral balance training with resistance training to improve muscle performance in older people. APTA Combined Sections Meeting, Indianapolis, IN, Poster, 2015.
8. **Gray VL**, Yang, CL, McCombe Waller S, Rogers MW. Associations between foot cutaneous sensation and muscle activation patterns during unexpected lateral perturbations after stroke. American Society of Neurorehabilitation, Chicago, 2015.
9. Rogers MW, McCombe Waller S, Savin DN, **Gray VL**. Pushing the limits: Novel strategies to balance. APTA Combined Sections Meeting, Anaheim, CA, February 18, 2016.
10. Hsiao, H, Creath R, **Gray, VL**, Binder-MacLeod, SA, Rogers, MW. Relationships between lateral weight transfer and walking speed during gait in individuals post-stroke. Annual Meeting of the American Society of Biomechanics, Raleigh, NC, Poster, 2016.
11. **Gray, VL**, Rogers MW. A comparison of perturbation induced and voluntary step training on lateral balance control during reaction time stepping in stroke. Annual Pepper Center Meeting, Arlington, VA, Poster, 2017.
12. **Gray VL**, Rogers MW, Goldberg A, Anthony L, Terrin M, Guralnik JM, Blackwelder W, Lam D, Lal BK. Asymptomatic carotid stenosis is associated with mobility and cognitive dysfunction and heightened fall rates in older adults, APTA Combined Sections Meeting, Washington DC, Poster, January 23-26, 2019.
13. Westlake KP, Rogers MW, **Gray VL**, Hsiao H. How to avoid a fall: Protective limb responses in aging and stroke. APTA Combined Sections Meeting, Washington DC, Symposium, January 23-26, 2019.

International

1. **Gray VL**, Ivanova T, Garland SJ. Exercise-induced remodeling of muscle activation patterns following stroke. XVIIth Congress of International Society of Electrophysiology and Kinesiology, Niagara Falls, ON, Presentation,2008.
2. **Gray VL**, Ivanova TD, Garland SJ. Motor control strategies in protective stepping movements after stroke. Society for Neuroscience, San Diego, CA, Poster, 2010.
3. **Gray VL**, Ivanova TD, Garland SJ. Postural responses are modified by exercise emphasizing speed of movement after stroke. Society for Neuroscience, Washington DC, Poster, 2011.
4. Pollock C, **Gray VL,** Wakeling JM, Ivanova TD, Garland SJ. Muscle activation patterns during a stepping reaction in people after stroke.Society for Neuroscience, New Orleans, LA, Poster, 2012.
5. **Gray V**, Pollock C, Wakeling J, Ivanova T, Garland SJ. Patterns of muscle coordination during stepping responses post-stroke. Progress in Motor Control, Montreal, QC, Poster, 2013.
6. **Gray V,** McCombe Waller S, Rogers MW. The disruption of postural responses and hand reach in standing from a startling acoustic stimulus can be modified by arm training in standing in persons post-stroke, International Society for Posture and Gait Research, Vancouver, BC, Poster, 2014.
7. **Gray VL**, Fujimoto, M, McCombe Waller S, Rogers MW. Protective stepping responses to lateral perturbations of standing balance in persons post-stroke. Society for Neuroscience, Washington DC, Poster, 2014.
8. **Gray VL**, Yang, CL, McCombe Waller S, Rogers MW. The influence of sensorimotor deficits on unexpected lateral perturbations after stroke. Society for Neuroscience, Chicago, IL, Poster, 2015.
9. Yang C-L, **Gray, VL** Fujimoto, M,McCombe Waller S,Rogers, MW. Reactive and voluntary stepping in individuals with stroke: a comparison between paretic and nonparetic leg responses. Society for Neuroscience, Chicago, IL, Poster, 2015.
10. Yang C-L, McCombe Waller S,Rogers, MW, **Gray, VL**. The effects of reactive and voluntary step training on balance recovery during lateral perturbations in individuals with chronic stroke. Society for Neuroscience, San Diego, CA, Poster, 2016.
11. **Gray VL,** Yang C-L, Obah, A, McCombe Waller S,Rogers, MW, Lateral balance control after stroke: A comparison of voluntary and perturbation induced stepping reactions, San Diego, CA, Poster, 2016.
12. Rogers MW, **Gray VL**, Creath R, McCombe Waller S, Beamer B, Abarro J, InacioM, Sanders O, Yang C. Intervention to Enhance Lateral Balance Function and Prevent Falls in Aging: First Results from the LIFT Study, International Society for Posture and Gait Research, Fort Lauderdale, FL, July 2017.